Thank you for purchasing EAGLE series of flight controller. If any difficulties are encountered while setting up or operating this board, please consult this manual first. For further help, you may also visit our website at http://www.hobbyeagle.com, or contact us via email eagle.koo@hotmail.com.

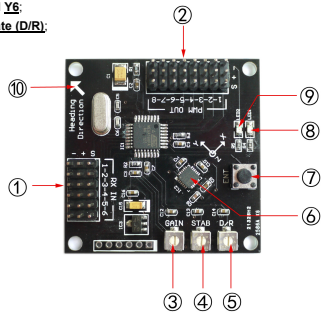
Features

- Integrated design of 6-axis (3 Gyro+3 Acc) MEMS sensor for **Self-stability and Self-balance**;
- 6 Multi-types supported: **TRI**, **QUAD+**, **QUADX**, **HEX6+**, **HEX6X** and **Y6**;
- Independent adjustment for **Gyro Gain**, **Stability Gain** and **Stick Rate (D/R)**;
- With a 2-axis PTZ camera stabilization system built in;
- Provides 5-level response rate setting for the sensor;
- One-key setting mode.

Specifications

Input Voltage: 5 ~ 6V DC (Provided by BEC of ESC)
Output PWM Range: 1520 ± 400μs
Frame Rate of PWM Output: 333Hz/ESC, 66Hz/Servo
Full-Scale Range of Gyro: ±2000dps
Full-Scale Range of Accelerometer: ±4g
Operating Temperature: -40 ℃ ~ 85 ℃
Dimensions: 50mm × 50mm
Weight: 12g

Overview



NO.	SHORT NAME	FULL NAME	FUNCTIONS
1	RX IN	6-CH Receiving In	1: Connects to the Aileron channel
			2: Connects to the Elevator channel
			3: Connects to the Throttle channel
			4: Connects to the Rudder channel
			5: Connects to the PTZ camera rolling control channel
			6: Connects to the PTZ camera pitch control channel
2	PWM OUT	8-CH ESC/Servo Out	1 - 6: Connects to the ESC or Servo (M1 - M6)
			7: Connects to the PTZ camera rolling servo
			8: Connects to the PTZ camera pitch servo
3	GAIN	Gyro Gain adjust knob	Adjusts the gyro gain, see *P3 "Gyro Gain Adjustment"*
4	STAB	Stability Gain adjust knob	Adjusts the stability gain, see *P3 "Stability Gain Adjustment"*
5	D/R	Stick Rate adjust knob	Adjusts the operating rate, see *P3 "Stick Rate Adjustment"*
6	IC2	Integrated 6-axis sensor	3-axis gyroscope + 3-axis accelerometer
7	ENT	Setting Button	For parameter setting
8	LED1	Blue LED indicator	For working or setting status display
9	LED2	Red LED indicator	For error report or setting status display
10	Forward Direction	Forward flight direction	Aligns the white arrow with forward flight direction when mounting the board

Attentions

1. In order to make the best out of your board, please read this manual carefully ahead;
2. Exam if your multicopter has been well installed before installation. To obtain the best performance, it is recommended to use a high-precision, good-quality fuselage and equipment.

Installation & Wiring

Use 4 screws (Φ3mm) to firmly fix the board in the center of your multicopter. Please align the white arrow with forward flight direction when mounting. After installation, connect the channels of Aileron, Elevator, Throttle and Rudder from your receiver to the

pins which are marked "RX IN 1-4". When you need to use the 2-axis PTZ camera, connect the rolling and pitch control channels to the pins "RX IN 5-6"; Connect the ESC or servo to the pins marked "PWM OUT" in the correct order, it is according to the selected multi-type refer to the illustration in the last page of this manual. While wiring, please pay attention to the symbol "S + -" beside the pins, "S" is the signal (white or yellow wire), "+" is VCC (red wire) and "-" is GND (black wire).

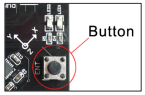
Initialization

Power on the board, it takes 2-3 seconds to initialize and perform self-calibration while the Blue light keeps flashing rapidly.
Do NOT move the multicopter during initialization or the sensor may not initialize properly. Inaccurate initialization could decrease the performance of the board or even result in complete failure.

Following the initialization, the Blue light will flash several times, the number of flashes indicates the current multi-type selected; see "*Func.2 - Multi-type Selection*". When everything is settled, the Blue light will stay on and it is ready for flight. When there is no signal detected, the Red light will keep flashing slowly. In this case, check the connection between the receiver and the board.

Setting Methods

Entering Setting Mode



Press and hold the button on the board, 2 seconds later both the Blue and Red lights will begin flashing rapidly, release the button to switch the board into ***"Setting Mode"***.

Function List

In the setting mode, the Blue and Red lights will flash N times at intervals of 3 seconds(N stands for the number of current function item). To move to the next item, quickly (less than 2 seconds) press and release the button once, the number of flashes will change to reflect this; To select a function, press and hold the button over 2 seconds, release it when both the Blue and Red lights begin flashing rapidly.

NO.	SETTING FUNCTIONS	LED INDICATION	DESCRIPTION
1	***Stick Centering***	Blue & Red, 1 Flash	Calibrates the center pulse width of signal input
2	***Multi-type Selection***	Blue & Red, 2 Flashes	Selects the current mix-control type
3	***Response Rate Selection***	Blue & Red, 3 Flashes	Sets the response rate for gyro and acc
4	***PTZ Setting***	Blue & Red, 4 Flashes	Adjusts the compensation ratio and direction for camera rolling and pitch servos
5	***Exit***	Blue & Red, 5 Flashes	Exits setting mode and returns to the flight mode

Func.1 - Stick Centering

This function is for calibrate the center pulse width of reception. **To obtain the highest performance it is recommended to perform this function after first-time installation or replacing a new radio system.** Following the steps below:

Step 1 Connect the receiver to the board by the corresponding channel first;
Step 2 Turn on the transmitter, put the trimming buttons to the center position, reset the *Sub-trim* parameters to *0*;
Step 3 Power on the board, enter setting mode after initialization and select the stick centering function;
Step 4 The Blue light will begin flashing rapidly for about 3 seconds which indicates that the board is calibrating signals. Don't move the sticks during this process. The Blue light will flash once again after 1 second and the board will return to the *Function List* automatically after calibration done.

Func.2 - Multi-type Selection

This function is used to select mix-control type of your multicopter. The Blue light will flash N times at intervals of 3 seconds (N stands for the number of multi-type selected). To move to the next type, quickly press and release the button once, the times of flash will change to reflect this. Hold the button until both the Blue and Red lights begin flashing rapidly to save changes and return to the *Function List*. (✱ is the default setting)

NO.	SETTINGS	LED INDICATION
1	TRI Copter (Y3)	Blue, 1 Flash
2	QUAD+ Copter	Blue, 2 Flashes
3	QUADX Copter ✱	Blue, 3 Flashes
4	HEX6+ Copter	Blue, 4 Flashes
5	HEX6X Copter	Blue, 5 Flashes
6	Y6 Copter	Blue, 6 Flashes

Func.3 - Response Rate Selection

This function is to choose the response rate for gyroscope and accelerometer. The Blue light will flash N times at intervals of 3 seconds (N stands for the number of level selected). The default setting "Level-2" is accepted for most multicopters. We recommend you to try this setting first. On high precision copter with high performance and small vibration, "Level-1" may work better. The "Level-5" may work better on larger and heavier copters. To switch between different levels, quickly press and release the button, the times of flash will change to reflect this. Hold the button until both the Blue and Red lights begin flashing rapidly to save changes and return to the *Function List*.

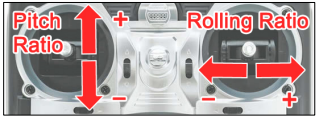
NO.	SETTINGS	LED INDICATION
1	Level - 1 (Fastest)	Blue, 1 Flash
2	Level - 2 (Fast) *	Blue, 2 Flashes
3	Level - 3 (Standard)	Blue, 3 Flashes
4	Level - 4 (Slow)	Blue, 4 Flashes
5	Level - 5 (Slowest)	Blue, 5 Flashes

Func.4 - PTZ Setting

A 2-axis PTZ camera stabilization system has been built in the board, the compensation ratio and direction of the rolling and pitch servos can be adjusted through this function. The value of ratio can be from -50 to +50, "+/-" represents the positive and negative direction, "0" is the factory default setting (**without compensation**).

Switching Channels After entering this function, the Blue light will flash once indicates that the rolling has been selected for the current setting channel initially, to switch to the pitch channel, quickly press and release the button once. The Blue light will flashes twice to reflect this. Before adjusting, you have to choose the corresponding channel first.

Adjusting Methods Move the aileron stick to the right or left to increase or decrease the ratio for rolling servo, and move the elevator stick to the up or down to increase or decrease the ratio for pitch servo. If holding the stick, the value will keep increasing or decreasing until the maximum or minimum been reached. The lights will keep flashing in different ways and color while the parameter is increasing or decreasing, refer to the table on the right. You can pick the multicopter up and rotate it to a certain angle to check whether the compensation angle is suitable.



LED INDICATION	DESCRIPTION
Blue, 1 Flash	Increase of 1
Red, 1 Flash	Decrease of 1
Blue, very rapid flashing	Maximum of +50 reached
Red, very rapid flashing	Minimum of -50 reached

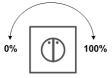
Exit Saving Changes Hold the button until both the Blue and Red lights begin flashing rapidly, release it to save changes and return to the *Function List* after adjusting.

Func.5 - Exiting Setting Mode

Once you have completed setting up the parameters, select this item to get back to the flight mode. For your safety, please make sure that the throttle stick is in the lowest before exiting or the Red light will not stop flashing rapidly until you put the stick down.

Gyro Gain Adjustment

The [GAIN] knob is used to adjust the gyro gain for pitch, roll and yaw, clockwise for increase, anticlockwise for decrease. The default setting 50% is acceptable for most multicopters. You need to fine tune it in order to get the best result during the flight.



Stability Gain Adjustment

The [STAB] knob is for adjusting the stability gain, clockwise for increase, anticlockwise for decrease. The greater the volume the faster the copter trying to level horizontally when the sticks are released, and vice versa. To get the best effect of self-stability, it should be adjusted together with the [GAIN] knob. **Tips: The self-stability function will be disabled if you turn [STAB] to 0%.**

Stick Rate (D/R) Adjustments

The [D/R] knob is used to adjust the operating rate for aileron, elevator and rudder sticks, clockwise for increase, anticlockwise for decrease. The default setting 50% will satisfy most beginners. Increase it if you would like the multicopter to be operated more flexible, and vice versa.

Throttle Range Calibration

This function is used to setup the throttle range for your ESC. **To obtain the best throttle linearity it is recommended to perform this function after first-time installation or replacing new ESC**. Following the steps below:

Step 1 Connect your receiver, ESC and motors to the board by the corresponding channel first;

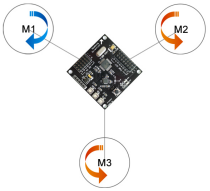
Step 2 Turn on the transmitter, move the throttle stick to the top position;

Step 3 Power on the board, the Red light will begin flashing rapidly. Move the throttle stick to the bottom when the sounds "Beep, Beep~" of throttle range highest point has been confirmed. The Red light will turn off while moving the throttle stick down. Specific construction shall be referred to the manual of your ESC;

Step 4 The board will exit this function automatically after waiting for about 5 seconds, keep the throttle stick at the bottom.

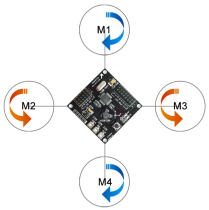
ESC or Servo Connections

TRI Copter

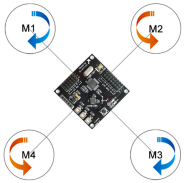


M4: Tail Servo
M5: Tail Servo (Gyro Direction Reversed)

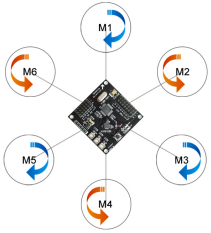
QUAD+ Copter



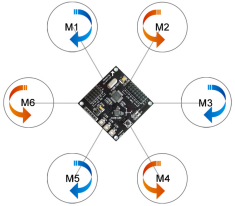
QUADX Copter



HEX6+ Copter



HEX6X Copter



Y6 Copter